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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/192,674	11/16/1998	DANIELE BAGNI	PHN-16.762	1092

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EXAMINER

CHEN, WENPENG

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 03/19/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/192,674

Applicant(s)

BAGNI ET AL.

Examiner

Wenpeng Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Examiner's responses to Applicant's remark

1. Applicants' arguments filed on 1/3/2002 have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference to reasonably and properly meet the claimed limitation.

2. Responses to Applicants' arguments

a. Applicants' argument -- Ng in view of Haan et al. neither teaches nor suggests limitation A of "filtering (MVPF) every occurrence of the first motion vectors (MVc, MVl, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8)," because de Haan neither teaches nor suggests limitation A based on the passage in page 373, right column, lines 2-9 of de Haan et al..

Examiner's response -- It is not correct to conclude that de Haan neither teaches nor suggests limitation A solely based on the above cited passage. *Actually the passage indicates that the filtering disclosed in reference 15, not the de Haan's method, has a drawback and requires improvement.* The method disclosed in Section II of de Haan, especially the part after page 373, right column, line 9, teaches *an alternative filtering process for the improvement.* It would have been obvious to one of ordinary skill in the art, at the time of the invention, that the teaching described by Eqs. (29)-(35) is a filtering process.

When Ng teaches processing blocks of size 16*16, its division to 4 subblocks produces a subblock of size 8*8. Therefore, Ng in view of de Haan indeed teaches limitation A.

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b. Applicants' argument -- Ng in view of de Haan et al. neither teaches nor suggests limitation B of "generating prediction errors in dependence on said second motion vectors only."

Examiner's response -- Ng teaches "generating prediction errors in dependent on the motion vectors associated with the second objects (8*8) being smaller than the first objects (column 5, lines 39-64.) The residues are the prediction errors. They are generated with motion compensation in dependent on the motion vectors associated with second objects of size 8*8 only. However, in Ng's case, the motion vectors associated with second objects of size 8*8 are the same as the motion vectors associated with their corresponding first objects of size 16*16. They are not the motion vectors generated through a filtering process as required in Claim 1.

The first paragraph of section VII of de Haan also teaches motion compensation. When Ng and de Haan are combined to achieve the advantage stated in the previous Office Action (paper #19,) it would have been obvious to one of ordinary skill in the art, at the time of the invention to use the motion vectors of the second objects generated through a filtering process as recited to generate the residues. Therefore, the combination of Ng and de Haan indeed teaches limitation B.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ng (US patent 5,146,325 cited previously) in view of de Haan et al. ("True-Motion Estimation with 3-D Recursive Search Block Matching," de Haan, G et al., IEEE Trans. On Circuits and Systems for Video Technology, vol. 3, No. 5, October 1993, pages 368-379 cited previously.)

Ng teaches a device and method for coding and decoding comprising the following means and corresponding steps for:

- estimating (ME) first motion vectors (MV c, MV l, MV r, MV a, MV b) for first objects (16*16) of a large size; (column 5, lines 39-64)
- generating prediction errors in dependent on the motion vectors associated with the second objects (8*8) being smaller than the first objects; (column 5, lines 39-64; The residues are the prediction errors.)
- combining (VLC) the first motion vectors and the prediction errors; (column 7, lines 44-61)
- generating (VCL⁻¹) first motion vectors (MV c, MV l, MV r, MV a, MV b) and prediction errors from input stream, the first motion vectors (MV c, MV l, MV r, MV a, MV b) relating to the first objects of a large size; (elements 306 and 308 of Fig.5; column 10, line 62 to column 11, line 23)
- generating an output signal in dependence on the prediction errors and the motion vectors associated with the second objects; (column 10, lines 31-61;)

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-- means for receiving a motion-compensated, predictively-encoded image signal;
(column 10, line 58 to column 11, line 12, The signal inputted to VLD 308 is the signal.)

-- means for displaying the decoded image signal. (column 9, lines 33-57)

However, Ng does not teach (1) the filtering steps (MVPF) and (2) using the second motion vectors only for generating prediction errors.

The de Haan paper teaches filtering steps comprising:

-- filtering (MVPF) every occurrence of the first motion vectors (MV_c , MV_l , MV_r , MV_a , MV_b) to obtain second motion vectors (MV_1 , MV_2 , MV_3 , MV_4) for second objects, the second objects being smaller than the first objects ($1/4$ of the first object); (section VII in pages 373-374)

- providing x and y motion vector components of a given macroblock (MV_c) and of macroblocks (MV_l , MV_r , MV_a , MV_b) adjacent to the given macroblock (MV_c); (section VII in pages 373-374; Eq. (33))

- supplying for each block (MV_1) of a number of blocks (MV_1 , MV_2 , MV_3 , MV_4) corresponding to the given macroblock (MV_c), x and y motion vector components respectively selected from the x and y motion vector components of the given macroblock (MV_c) and from the x and y motion vector components of two blocks (MV_l , MV_a) adjacent to the block (MV_1). (section VII in pages 373-374; Eq. (33); Fig. 7)

-- using only the obtained second motion vectors (MV_1 , MV_2 , MV_3 , MV_4) of the second objects, not the motion vectors of the second objects, for motion compensation to reduce visible block structures. (first paragraph in section VII)

It is desirable to reduce visible block structures in coding and decoding an image signal.
It would have been obvious to one of ordinary skill in the art, at the time of the invention, to add

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de Haan's filtering processes for motion vectors in Ng's method and system because the combination provides a better quality of decoded images by reducing blockiness.

Because the Ng's decoding process is a reverse process of its own coding process, it would be obvious to one of ordinary skill in the art, at the time of the invention, in the decoding process to add the following feature already discussed above to implement the decoding process:

-- filtering every occurrence of the first motion vectors (MV c, MV l, MV r, MV a, MV b) using a set of motion vectors including the first motion vectors to obtain second motion vectors (MV 1, MV 2, MV 3, MV 4) for second objects, the second objects being smaller than the first objects.

Because the filtering process is for the purpose for reducing visible block structures with block erosion, the filtering is applied to every occurrence of the first motion vectors and only the filtered motion vectors of the smaller blocks are used for motion compensation.

Conclusion

5. THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). The Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR

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1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 703 306-2796. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703 308-7452. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications. TC 2600's customer service number is 703-306-0377.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-4700.

Wenpeng Chen
Examiner
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March 18, 2002

